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NUMBERS 221 and 222 of ENGLER and PRANTL'S *Pflanzenfamilien* have appeared, the former containing a continuation of the lichens by A. ZAHLBRUCKNER, the latter a continuation of the mosses by V. F. BROTHERUS.—J. M. C.

THE SEVENTH FASCICLE of DALLA TORRE and HARMS'S *Genera Siphonogamarum*[12] has just appeared, including genera from Acanthaceae (7938. Echinacanthus) to Compositae (9371. Liabum).—J. M. C.

NOTES FOR STUDENTS.

PALEOBOTANICAL NOTES.—BRABENEC[13] records thirteen species of plants from a new locality, Holedeč, in the Saaz basin of northern Bohemia, describing new species in Carya, Acacia, Paliurus, and Porana.—BERRY[14] describes additional material from the Cretaceous near Cliffwood, N. J., consisting of rather fragmentary remains of nine additions to that flora, making the total number of known forms ninety-five.—The same author describes[15] a new palm, represented by abundant but fragmentary remains of leaves, from the mid-Cretaceous of the coastal plain in Delaware and Maryland.—In notes on Tertiary plants PENHALLOW[16] describes wood of Taxodium and Thuja from the basal Eocene of Alberta, and of Cupressoxylon from the Cretaceous of Assiniboia. Wood of *Pseudotsuga Douglasii* is identified from near Bozeman, Montana, and the characteristic Pleistocene *Larix americana* (*Larix laricina*) is identified from Georgia. The latter find is most interesting, showing as it does that the larch had pushed about 480 miles farther south than its present southern limit during the Scarborough period of the Glacial. Wood of *Pinus rigida* is recorded from the Pleistocene of New York; and *Juniperus californica* and *Pseudotsuga macrocarpa* are recorded from the Pleistocene at Orleans, Humboldt county, California. The paper concludes with an enumeration of a number of species, based on leaves and wood, from the well-known Don River Pleistocene of Canada.—WHITE[17] has a paper on "Fossil plants of the group Cycadofilices," in which the chief points of interest in this most interesting group are enumerated. He concludes, with WILLIAMSON, that secondary wood originated, polyphyletically and polychronously, as an engineering feature. It is suggested that the heterosporous filicean ancestors of the group Pteridospermae will be found in the lowest Carboniferous if not in the Upper Devonian. Should the author's *Kalymma grandis* prove to be pteridospermic, as is expected, it will serve to emphasize the evidence of the fossil wood (Dadoxylon) as to the occurrence of gymnospermous-like plants in the middle Devonian (Genesee), a time nearly as remote as that furnishing the oldest known ferns of undoubted authenticity, and would seem to render the search for ancestral forms of these comparatively highly organized pteridospermic types futile.—The same author gives[18] a systematic account of the Devonian flora of the Perry basin, Maine, listing twenty-nine species, not including nine more or less doubtful species which DAWSON reported from this locality. Several new generic and specific types are described, and numerous nomenclatorial points are cleared up. The paper is fully illustrated.—EDWARD W. BERRY.

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[12] DALLA TORRE, C. G. DE, and HARMS, H., Genera Siphonogamarum ad systema Englerianum conscripta. Fasc. 7. pp. 481–560. Leipzig: Wilhelm Engelmann. 1905. *M*6.

[13] BRABENEC, F., Ueber einen neuen fundort v. Tertiären Pfl., etc. v. Saazer Schichten Bull. Inter. Acad. Sci. Bohême, 1904. pp. 8 *pl. 1.*

[14] BERRY, E. W., Bull. Torr. Bot. Club **32**:43–48. *pls. 1–2.* 1905.

[15] BERRY, E. W., Torreya **5**:30–33. *figs. 2.* 1905.

[16] PENHALLOW, D. P., Trans. Roy. Soc. Can. II. **10**:57–76. 1904.

[17] WHITE, DAVID, U. S. Geol. Surv. Professional Paper No. 35: pp. 35–84. *pls. 2–6.* 1905.

CLAUSSEN[19] gives an account of the life history of the ascomycete Boudiera. The sexual organs consist of short filaments which are developed in clusters and become very much twisted together, presenting spirally wound structures somewhat resembling the sexual organs of Gymnoascus. These filaments are differentiated into antheridia and ascogonia which fuse. After fertilization a cluster of short ascogenic hyphae arise that develop a small group of asci which become loosely enveloped by surrounding paraphyses from sterile portions of the mycelium. The female organ is the thicker filament of the two and consists of an ascogonium, containing several nuclei, which bears a terminal sterile cell, perhaps two. The nuclei in the sterile cell break down, and it finally becomes the medium (conjugation tube or trichogyne) through which the protoplasm from the antheridium enters the ascogonium. The antheridial filament is thinner and also contains several nuclei, which after the fusion with the sterile terminal cell pass into the ascogonium. The fertilized ascogonium then contains some ten or twelve nuclei and the antheridial filament and sterile terminal cell are empty. The nuclei in the fertilized ascogonium fuse in pairs. The empty antheridial filament and sterile cell collapse. The fertilized ascogonium increases in size, the fusion nuclei become conspicuous, and it finally divides into several cells by cross walls. The ascogenic hyphae are very short and the tips take at once the form of a hook and contain four nuclei. One nucleus lies in the tip, another in the stalk, and the remaining two in the bent portion of the hook. The four-nucleate condition is derived from a two-nucleate, but the preceding history is not known. The pair of nuclei in the bent portion of the hook become separated by walls from the tip and base of the filament and shortly coalesce; this cell becoming then a young ascus containing the single fusion nucleus. Thus each ascogenic hypha develops a single ascus. The terminal cell remains indefinitely, but there is no development from it. Several asci are formed from one ascogonium, but not simultaneously. Their number is believed to agree with the number of fusion nuclei in the ascogonium. The process of spore formation appears to follow HARPER'S account, but details are not given. The paper ends with a long historical discussion of the disputed sexuality of the ascomycetes and supports HARPER'S conclusions.—B. M. DAVIS.

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[18] WHITE, DAVID, Smithsonian Miscellaneous Coll. **47**:377–390. *pls. 53–55.* 1905.

[19] CLAUSSEN, P., Zur Entwickelungsgeschichte der Ascomyceten Boudiera. Bot. Zeit. **63**^{1}:1–28. *pls. 1–3.* 1905.

ITEMS OF TAXONOMIC INTEREST are as follows: T. MAKINO (Bot. Mag. Tokyo **18**:156. 1904) has separated the Japanese form referred to *Croomia pauciflora* T. & G. as a distinct new species (*C. kiusiana*).—W. B. HEMSLEY (Hooker's Icon. Plant. IV. 8:*pl. 2781.* 1905) has named the type of a new West Australian genus of Compositae (Helichryseae) *Thiseltonia Dyeri*.—PH. VAN TIEGHEM (Jour. Botanique **19**:45–58. 1905) has made the genus Octocnema (provisionally placed under Olacaceae) the type of a distinct family (*Octocnemaceae*).—A. A. HELLER (Muhlenbergia **1**:111–118. 1905) has described new Californian species of Ribes, Trifolium, and Stachys.—J. CARDOT (Bull. Herb. Boiss. **5**:208. 1905) has described a new genus (*Alophosia*) of mosses from San Miguel.—L. RADLKOFER (*idem* 222) has described a new genus (*Sisyrolepis*) of Sapindaceae from Siam.—CARL MEZ (*idem* 232) has described a new Venezuelan genus (*Glomeropitcairnia*) of Bromeliaceae with two species.—J. C. ARTHUR (Annales Mycol. **3**:18. 1905) has described a new genus (*Baeodromus*) of Uredineae with two species.—E. L. GREENE (Ottawa Nat. **18**:215–216. 1905) has described new Canadian species of Malus and Fragaria (2).—W. FAWCETT and A. B. RENDLE (Trans. Linn. Soc. London II Bot. **7**:1–13. *pls. 1–2.* 1904), in a monograph of the Jamaican species of Lepanthes (Orchidaceae), recognize 12 species, describing 5 as new.—N. L. BRITTON (Bull. N. Y. Bot. Garden **3**:441–453. 1905), in his first "Contributions to the flora of the Bahama Islands," has published 15 new species and a new genus (*Bracea*) of Apocynaceae.—J. J. SMITH (Recueil Trav. Bot. Neerl. **1**:49–51. *pl. 2.* 1904) has described a new genus (*Gynoglottis*) of Orchidaceae from Sumatra.—M. L. FERNALD (Rhodora **7**:47–49. 1905) has described a new species of Comandra that ranges from Quebec to Assiniboia and Kansas.—F. STEPHANI (Hedwigia **44**:74. 1905) has described two new Himalayan genera (*Gollaniella* and *Massalongoa*) of Hepaticae.—L. DIELS and E. PRITZEL (Bot. Jahrb. **35**:564. 1905) have published a new Australian genus (*Pentaptilon*) of Goodeniaceae.—G. E. DAVENPORT (Fern Bulletin **13**:18–21. 1905) has published a new Mexican Aneimia, with plates.—A. and E. S. GEPP (Jour. Botany **43**:108. *pl. 470.* 1905) have described a new genus (*Leptosarca*) of the red algae from the South Orkneys.—J. M. C.

BERGH'S second paper[20] on the formation of heterotypic chromosomes deals with the behavior of the chromatin from the telophase of the last division in the sporogenous tissue up to the strepsinema stage of the first mitosis in the microspore mother-cell. In a very early prophase of the first mitosis in the mother-cell, slender filaments are formed from the chromosomes of the sporogenous cell. Synapsis then takes place and at its close the filaments appear as the

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[20] BERGHS, JULES, La formation des chromosomes hétérotypiques dans la sporogénèse végétale. II. Depuis la sporogonie jusqu'au spirème définitif dans la microsporogénèse de l'*Allium fistulosum*. La Cellule **21**:383–397. *pl. 1.* 1904.

"thick spirem." During synapsis the dual nature of the filaments is evident. It is due to a longitudinal approximation of two filaments and leads to the formation of the thick spirem. The so-called longitudinal division is merely the reappearance of the line of approximation. Consequently the reduction in the number of chromosomes seen in the prophase of the heterotypic division is only an apparent reduction, due to the approximation of two somatic chromosomes, which in the mature chromosomes play the rôle of daughter chromosomes. The reduction is really accomplished by the first mitosis, which separates these daughter chromosomes.

The third paper[21] in the series deals with microsporogenesis in *Convallaria majalis*. The results confirm the conclusions already drawn from the author's study of *Allium fistulosum* and *Lilium speciosum*. The two daughter chromosomes which constitute the mature heterotypic chromosome represent two longitudinal parts of one segment of the thick spirem. This thick spirem is formed by the longitudinal approximation of slender chromatic filaments, two by two. This approximation takes place during the synaptic contraction, and the separation takes place in the strepsinema stage, resulting in an apparent longitudinal division. The heterotypic division is a reduction division, which distributes to the two poles complete somatic chromosomes.—C. J. CHAMBERLAIN.

THE RESEARCHES of SCHWARZ, ELFVING, VOCHTING, RACIBORSKI, and others on the influence of gravitation upon the rate of growth of erect and inverted organs have been extended by the investigations of HERING[22] carried on in PFEFFER'S laboratory. This work adds support to the thesis generally maintained by earlier authors, that while the rate of growth of geotropic organs in natural position (vertical) is not affected by gravitation, such organs when inverted manifest a checking of the rate of growth in length. Improvement upon ELFVING'S technique was secured by using artificial light of constant intensity instead of sunlight for keeping the organs parallel with gravitation; also by substituting a non-shrivelling substratum for bread crumbs for the growing of fungi. For such organs as could not be maintained in a vertical position by the use of light, recourse was taken to the use of pulleys and weights. The experimental material employed includes both positively and negatively geotropic organs as found in members of various genera of fungi, of monocotyledons, and of dicotyledons, as well as the branches of weeping trees. While nodes of grasses constitute an exception, the uniformity of behavior revealed by numerous other forms is so great as to permit a formulation of this general statement, namely, parallelotropic organs as a consequence of inversion suffer a reduction in the rate of growth in length. In the case of the sporangiophores of Phycomyces prolonged inversion is followed by accelerated growth, although a temporary inversion (one hour) is followed by diminished growth. In the case of the descending branches of weeping trees, gravitation not only causes a reduced rate of growth, but also determines the locus of origin of new shoots. Growth correlations similar to those observed by RACIBORSKI in tropical lianas were obtained.—RAYMOND H. POND.

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[21] BERGHS, JULES, La formation des chromosomes hétérotypiques dans la sporogénèse végétale. III. La microsporogénèse de *Convallaria majalis*. La Cellule **22**:41–53. *pl. 1*. 1904.

[22] HERING, GEORG, Untersuchungen über das Wachsthum inversgesteller Pflanzenorgane. Jahrb. Wiss. Bot. **40**:499–562. 1904.

LAWRENCE[23] has published a bulletin containing a summary of our present knowledge and the results of his own investigations of a serious apple disease found thus far only in Oregon and Washington, that was first described by CORDLEY[24] under the common name "apple tree anthracnose." The disease is also known under the following common names: Oregon canker, black canker, blackspot apple canker, blackspot, deadspot, and sour sap disease. The present writer proposes that the disease be known as the "blackspot canker." The fungus causing it was described by CORDLEY[25] under the name *Gloeosporium malicorticis*, and has been described also by PECK[26] under the name *Macrophoma curvispora*. This fungus is known to injure apple trees seriously in the Pacific northwest by the production of cankers upon the smaller twigs and branches. Similar cankers were produced by inoculation from apple cankers upon the cherry, plum, prune, and peach by LAWRENCE, and he is inclined to the belief that the same fungus is responsible for cankers upon all of the hosts named. As a rule cankers do not appear upon the larger branches and the trunk, owing apparently to the resistance offered by the corky outer layers of the bark of such regions to the penetration of the fungus. LAWRENCE here reports for the first time that the same fungus causes also a dry rot of stored apples that may be rather serious under certain conditions. The cankers may appear within a week from the time of infection; ordinarily appearing from November to February, rapidly completing their development after renewal of growth on the part of the host, and becoming mature by the next June or July. No definite statement can yet be made regarding either treatment of the disease or as to possible resistant varieties.—E. MEAD WILCOX.

A MUCH NEEDED INVESTIGATION of the rôle of latex in the metabolism of plants has been commenced by KNIEP,[27] and if continued may lead to valuable results. The paper here cited is presented in four sections. The introduction carefully reviews the literature, showing that theories are not supported by facts and that experimental results do not agree. The second section contains experimental evidence obtained by the author, which establishes that the latex participates very little, if at all, in the translocation of nutrient substances. Seedlings subjected to conditions intended to force an exhaustion of storage products showed no difference as to quantity or form of starch grains in the latex as compared with controls. The author does not regard the latex starch of the euphorbias with which he experimented as a typical storage product. SCHIMPER'S results that the latex tubes of the euphorbias do not participate in the depletion of carbohydrates is verified. The third section comprises an anatomical study of thirty-six species distributed in seven families of laticiferous plants. DEBARY'S view that latex tubes and sieve tubes are reciprocal tissues is rejected. The opinion of HABERLANDT that latex tubes function as translocation parenchyma is also discredited. The final section presents an ecological view of the problem, and two functions are assigned as ecological, namely, the closing of wounds by the exudation of latex, and protection against animals secured by presence of poisonous, acrid, or ill-smelling substances. That the problem remains unsolved, and that the chief value of his paper consists in formulating the present status of investigation as well as in indicating promising lines of research, is fully realized by the author.—RAYMOND H. POND.

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[23] LAWRENCE, W. H., Blackspot canker. Bull. Wash. Exp. Sta. 66. pp. 35. *pls. 13*. 1904.

[24] CORDLEY, A. B., Apple tree anthracnose: a new fungus disease. Bull. Oregon Exp. Sta. 60. pp. 3–8. *pls. 1–3*. 1900.

[25] CORDLEY, A. B., Some observations on apple tree anthracnose. BOT. GAZETTE **30**:48–58. *figs. 1–12*. 1900.

[26] PECK, C. H., New species of fungus. Bull. Torr. Bot. Club **27**:21. 1900.

[27] KNIEP, HANS, Ueber die Bedeutung des Milchsafts der Pflanzen. Flora **94**:129–205. 1905.

MITOSIS in the salamander (*Salamandra maculata*) has been investigated by KOWALSKI[28] under the direction of GREGOIRE. The object of the investigation was to compare typical animal mitoses with the mitoses in the roots of Trillium as described by GREGOIRE and WYGAERTS (see BOT. GAZETTE **38**:396. 1904). Mitosis was studied in various tissues, but principally in the epithelial cells. In general it may be said that even in minute details the structures and the sequence of events are essentially the same as in Trillium. In the telophase the action of the nuclear sap outside the chromosome results in the production of anastomoses between the neighboring chromosomes and between parts of the same chromosome; while the action of the sap within the chromosome brings about an alveolar and reticular structure. Each chromosome forms a network of lamellae and filaments of various shapes and sizes which cross each other in every direction. The entire chromatic network of the nucleus is made up of the individual networks. The behavior of the chromatin in the prophases is strong evidence in favor of the individuality of the chromosome. The longitudinal splitting of the chromosome is not due to the bipartition of a series of chromatic disks imbedded in a substratum, but consists simply in the longitudinal cleavage of a chromatic ribbon. No disk spirum is formed at the telophase, nor is any spirem formed at the prophase. The nuclear membrane is formed by the condensation of the cytoplasm bordering upon the nuclear vacuole, and at its formation no cytoplasm is included within the nuclear cavity.—C. J. CHAMBERLAIN.

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[28] KOWALSKI, J., Reconstitution du noyau et formation des chromosomes dans les cinèses somatiques de la larve de Salamandre. La Cellule **21**:349–377. *pls. 1–2* 1904.

SEVERAL RECENT INVESTIGATIONS have brought to light a curious condition in certain plankton diatoms which is believed to be a method of spore formation. The contents of certain cells break up into a number of small bodies which are termed "microspores." These structures have been recently investigated by KARSTEN[29] in a species of Corethron. Their development begins in this form with a remarkable increase in the number of nuclei in a single diatom, until as many as 128 are present. The nuclei divide mitotically and the protoplasm successively until this large number of bodies are found, which however often remain connected with one another by delicate fibrils of protoplasm. KARSTEN believes that "microspores" which escape from the mother diatom are gametes and unite with one another in pairs to form a zygospore. Further, there is evidence that the zygospore gives rise to two new diatoms and that each of these contains at first two nuclei, one of which afterwards breaks down. If this should be established, we should have presented in the diatoms a method of sexual reproduction followed by a type of germination with two successive mitoses apparently of the same character as in the desmids. It is fair to say, however, that KARSTEN seems to draw his conclusions from a rather imperfect series of stages.—B. M. DAVIS.

PELETRISOT[30] has published an extended study of the development of the seeds of Ericaceae, including in his examination twenty-six genera and sixty-two species. Such a survey can only mean a glimpse of a general situation, which subsequent research will develop properly. Aside from anatomical details of tissues, which can hardly be related as yet, the general morphological situation seems to be about as follows. The most striking feature of the embryo sac is the development of a large haustorial pouch at each end. This haustorium varies much in size in different genera, reaching its maximum in Arbutus; and also in its degree of separation from the central cavity, sometimes being separated only by a slight constriction, and in other cases by a narrow, more or less prolonged neck. In many of the genera there is also a well-developed jacket-layer investing the central cavity of the sac. The synergids are often beaked and extended into the micropyle, and the antipodals are ephemeral.

Aside from the extent of the survey and the prolix presentation, the most notable feature of the paper is the absence of all knowledge of any English or American publications dealing with similar haustorial developments.—J. M. C.

THE POSITION of the monocotyledons is discussed in a recent paper by FRITSCH.[31] Since the geological history is so fragmentary, we must rely upon the evidence of comparative morphology. After discussing this evidence, including recent investigations in anatomy, the conclusion is reached that the Ranales and Helobiales are related groups; not, however, that any particular family in one has come from a family in the other, but that both have been differentiated from a common ancestry. HALLIER'S theory that the entire group of the angiosperms is monophyletic and that it has come from a Ranales-like type, is, according to FRITSCH, a broader conclusion than is warranted by the present condition of our knowledge. Since the dicotyledons show some characters more nearly resembling conditions found in gymnosperms, the dicotyledons should be placed before the monocotyledons in any scheme of classification.—C. J. CHAMBERLAIN.

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[29] KARSTEN, G., Die sogenannten "Mikrosporen" der Plankton-Diatomeen und ihre weitere Entwickelung beobachtet an *Corethron Valdiviae*. Ber. Deutsch. Bot. Gesells. **22**:544–554. *pl. 23*. 1904.

[30] PELETRISOT, C.-N., Développement et structure de la graine chez les Ericacées. Jour. Botanique **18**:309–367, 386–402. *figs. 173*. 1904.

[31] FRITSCH, K., Die Stellung der Monokotylen im Pflanzensystem. Engler's Bot. Jahrb. Beiblatt No. 79. pp. 22–40. 1905.

SHIBATA[32] has investigated the chemotaxis of the sperms of Isoetes. He finds the stimulation limit to be $m/20000$ malic acid. Of seventy other substances tested in concentrations of $m/10$ to $M/100$, only neutral salts of succinic, fumaric, and *d*-tartaric acids, which are in structure closely allied to malic acid, were attractive, the lower limit being $m/100$ to $5m/1000$. WEBER'S law was found applicable. The relative chemotactic effect of H-ions was found equal in various mineral acids and salts; similarly, OH-ions from equivalent solutions of alkalies acted alike. Other interesting results bear on negative chemotaxis of anions, osmotaxis, and the nature of the reactions. The notice is a preliminary one.—C. R. B.

KOERNICKE[33] has reviewed several recent cytological papers, thus bringing his work on "The present condition of cell studies" up to date. The only important change of opinion noted is in regard to the occurrence of a reduction division in plants. The evidence given in the previous paper was against such a division, but in light of the more recent researches, especially those of FARMER and MOORE, KOERNICKE believes that the evidence in favor of reduction division is gradually increasing. The work of WILLIAMS, GREGORY, LOTSY, ROSENBERG, BOVERI, GRÉGOIRE and WYGAERTS, and HÄCKER are considered in this summary.—CHARLES J. CHAMBERLAIN.

WIESNER,[34] who has already pointed out two cases of the dropping of leaves which he calls *Sommerlaubfall* and *Treiblaubfall*, adds another, due to high temperature combined with drouth, which he calls *Hitzelaubfall*. The death of the leaves is due to excessive transpiration not covered by the available water. Naturally the peripheral leaves and especially those reached most directly by the sun are most affected. Observations are adduced from the author's extended tour in the United States during the months of August and September.—C. R. B.

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[32] SHIBATA, K., Studien über die Chemotaxis von Isoetes-Spermatozoiden. Ber. Deutsch. Bot. Gesells. **22**:478–484. 1904.

[33] KOERNICKE, M., Die neueren Arbeiten über die Chromosomreduktion im Pflanzenreich und daran anschleissende karyokinetische Probleme. Bot. Zeitung 62^1:305–314. 1904.

[34] WIESNER, J., Ueber den Hitzelaubfall. Ber. Deutsch. Bot. Gesells. **22**:501–505. 1904.

STEMS OF CALAMITES with attached roots are rare, but several specimens have been described by MASLEN,[35] whose account clears up several doubtful points. The roots in question are mainly adventitious and spring from the nodes of the aerial as well as the subterranean stems. These roots may be distinguished from branches among other ways by their point of origin, which however is different from that of the roots of Equisetum. The writer finds no evidence for connecting the roots with the infranodal organs described by WILLIAMSON.—M. A. CHRYSLER.

GUIGNARD[36] has presented further interesting details in connection with double fertilization in the Malvaceae, using *Althaea rosea* and *Hibiscus Trionum*. Each large and very characteristic pollen grain puts out several pollen tubes, which advance through the tissues of the style and the nucellus in a peculiar way. In Hibiscus, when the embryo sac is reached, the tube branches irregularly. The formation of the generative nucleus and male cells, and the occurrence of starch are described in detail.—J. M. C.

MISS SARGANT and MISS ROBERTSON[37] call attention to the fact that the furrows on the dorsal face of the scutellum in *Zea Mais* should be regarded as glands which increase the extent of secreting surface. These glands are situated in contact with the floury part of the endosperm, and so secure a rapid transfer of food to the seedling while it as yet has no assimilating organs. An interesting observation is the presence of amphivasal strands and of transfusion tissue in the scutellum.—M. A. CHRYSLER.

DRABBLE'S studies on the roots of palms[38] show that the polystelic condition found in Areca is not exceptional, but that it commonly occurs in the proximal region of secondary roots. These separate steles usually fuse in the distal region of the root to form a single cylinder; certain vascular strands, however, may remain unfused and constitute the well-known medullary strands. The monostelic central cylinder of palm roots has thus by no means a simple origin.—M. A. CHRYSLER.

WALLER finds[39] that practically no sea plants give blaze currents following an induction shock, while practically no land plants fail to do so. Resistance of young tissues is very high, and is lowered much by one shock, which probably means that the lacking electrolytes are produced by dissociation upon passing the induction current. Killed tissues show no blaze currents.—C. R. B.

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[35] MASLEN, A. J., The relation of root to stem in Calamites. Ann. Botany **19**:61–74. *pls. 1–2.* 1905.

[36] GUIGNARD, L., La double fécondation chez les Malvacées. Jour. Botanique **18**:296–308. *figs. 16.* 1904.

[37] SARGANT, E., and ROBERTSON, A., The anatomy of the scutellum in *Zea Mais* Ann. Botany **19**:115–124. *pl. 5.* 1905.

[38] DRABBLE, ERIC, On the anatomy of the roots of palms. Trans. Linn. Soc. London. II. Bot. **6**:427–490. *pls. 48–51.* 1904.

[39] WALLER, A. D., On the blaze currents of vegetable tissues. Jour. Linn. Soc. Bot. **37**:32–50. 1904.

TREBOUX[40] in a preliminary paper announces that for chlorophyllous plants the source of N *par excellence* is the ammonia radicle, rather than amido-acids. The significance whereof lies in its relation to a general theory of proteid synthesis to which the author has been led by his experiments.—C. R. B.

VON SPIESS shows[41] that the so-called green aleurone does not exist, such grains being really more or less degenerate chloroplasts. Bluish aleurone grains occur in maize, the color being due to anthocyan.—C. R. B.

GATIN[42] has described cases of polyembryony in two palms, *Phoenix canariensis* and *Pinanga patula*, but gives no account of the origin of the embryos.—J. M. C.

BONNIER[43] has compared in detail the embryo sac of gymnosperms and angiosperms, reaching the conclusion that the most fundamental difference between the two groups is that in gymnosperms all the eggs formed in an embryo sac are alike; while in angiosperms the two eggs usually produced are unlike, one forming the embryo, the development from the other stopping at the proembryo stage (endosperm). This is an effort to include double fertilization in contrasting gymnosperms and angiosperms, but does not explain anything.—J. M. C.

MISS RIDDLE[44] has studied the development of *Staphylea trifoliata* from the megasporangiate archesporial cell of the embryo. The account presents no unusual features, but it is a matter of interest to note that double fertilization was observed. A definite account of some of the forms of Sapindales was much needed.—J. M. C.

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[40] TREBOUX, O., Zur Stickstoff-Ernährung der grünen Pflanzen. Ber. Deutsch. Bot. Gesells. **22**:570–572. 1905.

[41] VON SPIESS, KARL, Ueber die Farbstoffe des Aleurone. Oesterr. Bot. Zeits. **54**:440–446. 1904.

[42] GATIN, C. L., Quelques cas de polyembryonie chez plusieurs espèces de palmiers. Rev. Gén. Botanique **17**:60–65. 1905.

[43] BONNIER, GASTON, Remarques sur la comparaison entre les angiospermes et les gymnospermes. Rev. Gén. Botanique **17**:97-108. *figs. 6.* 1905.

[44] RIDDLE LUMINA C., Development of the embryo sac and embryo of *Staphylea trifoliata*. Ohio Naturalist **5**: 320-325. *pls. 19-20.* 1905.